USDA NRCS
United States Department of Agriculture
Natural Resources Conservation Service

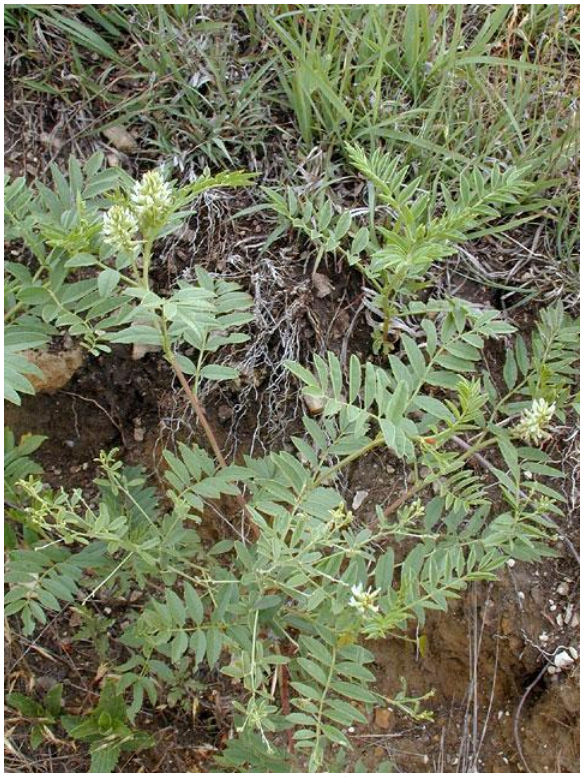
Plant Guide

AMERICAN LICORICE

Glycyrrhiza lepidota Pursh.

Plant Symbol = GLLE3

Contributed by: USDA NRCS Plant Materials Center, Manhattan, Kansas



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Alternate Names wild licorice, licorice-root and dessert root

Uses

Grazing/Rangeland: Weaver (1954) indicated that licorice was greedily eaten by livestock, especially when young. He went on to say that despite its great store of food underground in roots and rhizomes, it is practically all dead by the time close grazing has resulted in fair pasture conditions. Fransen and Boe (1981) determined that licorice produced highly digestible forage. Their analysis concluded that American licorice is highly nutritious and compares favorably with alfalfa. Its bur-like seed pod can become entangled in sheep wool and cause dockage when sold.

Wildlife value: Deer and pronghorn antelope consume the foliage (Stubbendieck and Conard, 1989). While birds and small rodents eat the seeds of licorice, plains pocket gophers consume their roots.

Erosion control: Weaver (1954) determined that a licorice root system extended some 12 feet (3.6-m) into the prairie soil. Allen and Allen (1981) recognized licorice for its soil binding capabilities and Duke (1981) indicated that it has wide ecological amplitude. Whitman, in 1979, noted that licorice exhibited vigorous growth on mine spoil materials near Dickinson, North Dakota.

Ethnobotanical: American licorice was widely used as medicine by Indians of the Great Plains. Kindscher (1992) described several uses Native American made of licorice. The Cheyenne's drank medicinal tea made from the peeled, dry roots of the plant for diarrhea and upset stomach. The Lakota's used the root as a medicine for flu. The Dakota's steeped the licorice leaves in boiling water to make a topical medicine for earache. The root was also chewed and held in the mouth to relieve toothache. The Blackfeet made a tea from bitter tasting root to relieve coughs, chest pain and sore throat. Kindscher (1987) also detailed the Native Americans use of licorice as food. The Cheyenne ate the young shoots of licorice plant raw in the early spring. The Indians later would roast the roots in their campfire embers, and then pound the roots with a stick to remove the tough woody string from the center of the root. When the string was removed it left a food that had a taste similar to sweet potatoes.

Status

Please consult the PLANTS Web site and your State Department of Natural Resources for this plant's current status (e.g. threatened or endangered species, state noxious status, and wetland indicator values).

Description

General: Legume family (Fabaceae). American Licorice is a native perennial legume common to disturbed areas, draws, woods, and depressions over much of temperate North America (Duke, 1981). The plant reproduces by seed and underground stems called rhizomes. Licorice grows 1.5 to 3.5 feet tall (.5 to 1.0-m). The stems are smooth, erect and branched.

The leaves are smooth, alternately attached to the stem, and have many (7 to 21) leaflets (odd-pinnate) that are arranged opposite each other along the leaf stem. The flowers are on short stalks and crowded on terminal spikes. Its flowers are yellowish-white and shaped similar to alfalfa flowers. Flowers bloom in June to August and seed matures from July to October. The seed pods are brown, leathery, and ½ to 1.0 inch long (1.25 to 2.54-cm). The pods are covered with many stout, hooked, brown spines which form a bur. This hooked pod assists the plant in dispersal since they stick to animal fur and are moved to new sites. Seeds are green to reddish-brown, smooth and bean shaped.

Distribution: For current distribution, please consult the Plant Profile page for this species on the PLANTS Web site.

Habitat: Licorice is found on sites that range from moist to moderately dry, usually in rich soils. This plant can be located along streams, in grasslands, along roadsides and railway right-of-ways in sites that have suffered mild disturbance.

Adaptation
Glycyrrhiza lepidota is adapted to prairie settings that might be moister than the norm. An information paper highlighting the adaptability of 31 native species to salinity, sodicity, pH, and flooding tolerance was reported by Montana State University researchers. The paper indicated that American licorice was moderately tolerant to salinity, was very tolerant to sodium, was tolerant of short term flooding and could live in pH ranges from 4.8 to 7.2. This information makes licorice a species that can stand a lot of negative environmental influences and still produce forage or cover on land affected by salt or sodium. These tolerant species are rare and can be utilized on a number of problem sites.

Establishment
Seed used by Boe and Wynia (1985) in their greenhouse and field experiments were all scarified for 5 seconds in a Forsberg laboratory scarifier prior to planting. The process of scarification of the seed produced a higher rate of germination and more uniform stands in the field. Since it is a legume licorice should be inoculated with *rhizobium Glycyrrhiza* Spec. 1 inoculant. This characteristic of the plant would have potential for utilization as a soil stabilizer on disturbed sites, particularly those that are low in available nitrogen.

Management
The management of American licorice is determined by the intended use of the species. If erosion control is the intended use then management for maximum ground cover would be expected. If used for forage then management would be to incorporate the plant into a warm-season grass mix for foliage and nitrogen production.

Pests and Potential Problems
The loss of seeds as a result of insect predation is a potential threat to the maintenance and expansion of plant populations. Boe etal. (1988) indicated that the bruchid beetle *Acanthoscelides aureolus* (Horn) was a major seed predator on American licorice. They found that frequency of seed predation varied significantly between years. In an earlier study Boe and Wynia (1985) found that bruchid beetles were present in 37 populations of licorice pods collected in North and South Dakota. The overall mean infestation of 74, 50-seed samples was 41%. The data indicated that seed beetles have the ability to drastically reduce the number of viable seed produced by *G. lepidota*. Mankin (1969) reported that a rust fungus *Uromyces glycyrrhizae* was found on licorice specimens in South Dakota. Seed predation, reduced flowering in monoculture settings and chlorophyll deficient seedlings within populations are some of the potential problems that *G. lepidota* faces before being considered for forage or conservation use in a domestic situation.

Environmental Concerns
Glycyrrhiza lepidota has a tremendous capacity for vegetative reproduction via rhizomes. This might lead to the case for suspected weediness of this species. The state of Wyoming has declared it a restricted noxious weed seed. In fact, Whitson (1992) produced a research report that dealt with control of wild licorice at two growth stages with various herbicides. This may have come about because of the bur-like seed pod that attaches to the wool of sheep and the fur of other domestic animals.

Seeds and Plant Production
Whitman (1979) found the germinability of field collected *G. lepidota* seeds to be among the highest of 30 native forb species from North Dakota, but he also cautioned that germination varied considerably between years of collection. Boe and Wynia (1985) found that considerable variation was found among licorice populations for greenhouse and field emergence. Percent emergence in the greenhouse ranged from 0 to 97%, while field emergence ranged from 0 to 73% with an overall mean of 41%. Two populations that Boe and Wynia (1985) worked with

exhibited rapid and uniform germination and field establishment after scarification, but exhibited chlorophyll deficient seedling in both greenhouse and field plantings. Seedlings with chlorotic cotyledons did not produce leaves above the cotyledons and were generally dead within 10 days of emergence. Total chlorophyll (chlorophyll a and b) of the deficient seedlings were highly significantly ($P<0.01$) less than those of normal seedlings from the same population (Wynia et al. 1981). Vigor ratings of meter row plots after a year of establishment indicated that plants could be successfully established from seed. Stem lengths of up to 30 inches tall (75-cm.) were measured the second year, but very little flowering and seed pod set were observed. Rhizome production on the populations studied by Boe and Wynia (1985) was prolific. Their data indicated that *G. lepidota* ecotypes from South Dakota have tremendous vegetative reproductive potential.

Cultivars, Improved, and Selected Materials (and area of origin)

At the present time there are no cultivar releases or any type of plant materials release of American licorice.

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